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REMARKS/ARGUMENTS

Claims 1-11 are pending in this application.

Applicant greatly appreciates the Examiner's indication that claims 1-4 and 8-10 are allowed.

Claims 5 and 7 were rejected under 35 U.S.C. § 102(e) as being anticipated by Xie et al. (U.S. 5,644,634). Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Xie et al. in view of Felder et al. (U.S. 6,370,244). Applicant again notes that, although the Examiner did not include claim 11 in the description of the rejection over Xie et al. in view of Felder et al., since claim 11 is discussed in the body of this rejection, Applicant assumes that the Examiner intended to reject claim 11 along with claim 6 over Xie et al. in view of Felder et al. Applicant respectfully traverses these rejections.

Applicant's claim 5 recites:

> "A multi-frequency tone detector comprising an analysis filter for detecting the tone energies of an input signal at a plurality of tone frequencies of interest and a decision logic block for detecting presence or absence of said tone frequencies of interest based on said detected tone energies, characterized in that **said analysis filter has a window size chosen such that adjacent ones of said tone frequencies of interest are located at spectral nulls of said filter.**" (emphasis added)

The Examiner alleged that Xie et al. teaches each and every feature recited in Applicant's claim 5, including allowing different window sizes for each bin, and "as such, each window size would be chosen so that the adjacent ones of said tone frequencies of interest are located at the spectral nulls of the filter."

In addition, in the Response to Arguments section on page 4 of the outstanding Office Action, the Examiner alleged that "Xie [et al.] discloses adjusting the frame size (N) so as to allow the frequency bins to be located directly at the detected frequency, as opposed to a single set frame size that does not allow the frequencies to be aligned in the bins (Col 9 lines 10-20). The purpose of Xie [et al.] using variable frame lengths is

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to allow the frequency bins to align with the detected frequency in order to minimize the amount of leakage. This format entails the analysis filter searching a different sized frequency bin (that would be defined by the spectral nulls of the analysis filter) for each tone being detected (Col 8 line 19 to Col line 36)." Applicant respectfully disagrees.

Contrary to the Examiner's allegations, neither the portions of Xie et al. cited by the Examiner, nor any other portion of Xie et al. teaches or suggests anything at all about **spectral nulls** of the filter or that any of the tone frequencies of interest are located at spectral nulls of the filter. The Examiner is reminded that prior art rejections must be based on evidence. Graham v. John Deere Co., 383 U.S. 117 (1966). The Examiner is hereby requested to cite a reference in support of his position that it was well known at the time of Applicants' invention to choose a window size such that adjacent ones of said tone frequencies of interest are located at spectral nulls of said filter. If the rejection is based on facts within the personal knowledge of the Examiner, the data should be supported as specifically as possible and the rejection must be supported by an affidavit from the Examiner, which would be subject to contradiction or explanation by affidavit of Applicants or other persons. See 37 C.F.R. § 1.104(d)(2).

In contrast to Applicant's claim 5, Xie et al. teaches the use of different window sizes for each bin, that the window size is chosen to be most accurate for each bin, and that each window size is centered on the desired frequency. However, in Xie et al., the window sizes are chosen without **any** regard to the interfering adjacent frequencies. The window size is chosen to minimize leakage out of the window (i.e. Gibbs effect), and to provide good suppression in the stop band of all frequencies. Xie et al. does not choose the window sizes such that adjacent ones of the tone frequencies of interest (i.e. interfering MF signals) are located at spectral nulls of the filter as recited in Applicant's claim 5.

To assist the Examiner in better understanding the differences between the present claimed invention and the invention of Xie et al., Applicant submits herewith two figures which show the locations of the tone frequencies with respect to the spectral

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nulls according to the present invention and the location of the tone frequencies with respect to the spectral nulls according to Xie et al.

As described above, Xie et al. chooses the window size so as to minimize leakage energy out of the bin. K is an indication of how many full periods (oscillations) of the frequency are in the window. For example, in col. 10, line 56 of Xie et al., N=172 for 697 Hz. Each window contains 14.985 periods of 697 Hz. The error K, is an indication of how close Xie et al. is to providing full periods of the frequency within the window N. Since the window size N must be an integer, the values of K are constrained. This has absolutely nothing at all to do with the placement of the spectral nulls.

Xie et al. uses N=172 for 697 Nz, N=177 for 770 Hz, N=178 for 852 Hz and N=178 for 941 Hz. According to Applicant's claim 5, with a window size chosen such that adjacent tone frequencies are located at the spectral nulls of the filter, N=219 for 697 Hz, N=219 for 770 Hz, N=195 for 852 Hz and N=180 for 941 Hz. From the foregoing explanation and the attached figures, it is clear that the design criteria of Applicant's claim 5 is completely different from Xie et al. As clearly seen in the attached figures, the adjacent tone frequency of interest (770 Hz) falls on a spectral null in the present invention, whereas in Xie et al. the adjacent tone frequency of interest (770 Hz) does **NOT** fall on a spectral null.

Accordingly, Applicant respectfully submits that Xie et al. clearly fails to teach or suggest the features of "said analysis filter has a window size chosen such that adjacent ones of said tone frequencies of interest are located at spectral nulls of said filter" as recited in Applicant's claim 5.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claim 5 under 35 U.S.C. § 102(b) over Xie et al.

Felder et al. was relied upon to allegedly teach a rectangular window size. However, Felder et al. clearly fails to teach or suggest "said analysis filter has a window size chosen such that adjacent ones of said tone frequencies of interest are located at

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spectral nulls of said filter" as recited in Applicant's claim 5. Thus, Applicant respectfully submits that Felder et al. fails to cure the deficiencies of Xie et al. described above.

Accordingly, Applicant respectfully submits that Xie et al. and Felder et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of method steps and features recited in claim 5 of the present application.

In view of the foregoing amendments and remarks, Applicant respectfully submits that Claim 5 is allowable. Claims 6, 7 and 11 depend upon claim 5, and are therefore allowable for at least the reasons that claim 5 is allowable. Claims 1-4 and 8-10 are allowable as indicated by the Examiner.

In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

                                     Respectfully submitted,

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PRESENT INVENTION

DTMF Freq 697 Hz, Rectangula